Ada Lovelace – Criticism

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Wednesday 11th May, 2016

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Who developed the "first computer program"?

Conjecture. *Ada Lovelace is the first computer programmer.*

Pro

> She became the first person known to have crossed the intellectual threshold between conceptualizing computing as only for calculation on the one hand, and on the other hand, computing as we know it today.

— Fuegi, John and Francis, Jo (October–December 2003), "Lovelace & Babbage and the creation of the 1843 'notes'", Annals of the History of Computing (IEEE) 25 (4): 16–26. p. 16.

Contra

Allan G. Bromley, in the 1990 article Difference and Analytical Engines, wrote,

> All but one of the programs cited in her notes had been prepared by Babbage from three to seven years earlier. The exception was prepared by Babbage for her, although she did detect a 'bug' in it. Not only is there no evidence that Ada ever prepared a program for the Analytical Engine, but her correspondence with Babbage shows that she did not have the knowledge to do so.

— Bromley, Allan G. (1990). "Difference and Analytical Engines", In Aspray, William, Computing Before Computers, Iowa State University Press, pp. 59–98, p. 89, ISBN: 0813800471.

Bruce Collier wrote in his PhD thesis,

Contra

> She made a considerable contribution to publicizing the Analytical Engine, but there is no evidence that she advanced the design or theory of it in anyway.

— Collier, Bruce (1970). "The Little Engines that Could've: The Calculating Machines of Charles Babbage", PhD thesis, Harvard University, Chapter 3.

Contra

> Ada Lovelace's addition – her "Notes" – were more a reflection of the mathematical uncertainty of the author, the political purposes of the inventor, and, above all, of the social and cultural context in which it was written, than a blueprint for a scientific development.

— Stein, Dorothy (1984). "Lady Lovelace's Notes: Technical Text and Cultural Context", Victorian Studies 28 (1): 33-67, p. 34.

What are the primary sources?

Babbage wrote in his Autobiography in 1864,

> I then suggested that she add some notes to Menabrea's memoir, an idea which was immediately adopted. We discussed together the various illustrations that might be introduced; I suggested several but the selection was entirely her own. So also was the algebraic working out of the different problems, except, indeed, that relating to the numbers of Bernoulli, which I had offered to do to save Lady Lovelace the trouble. This she sent back to me for an amendment, having detected a grave mistake which I had made in the process.

— Charles Babbage (1864). Passages from the Life of a Philosopher, p. 136, ISBN: 0813520665.

Claim. Babbage states, that he developed the Bernoulli numbers program published in Ada Lovelace's Note G in 1843.

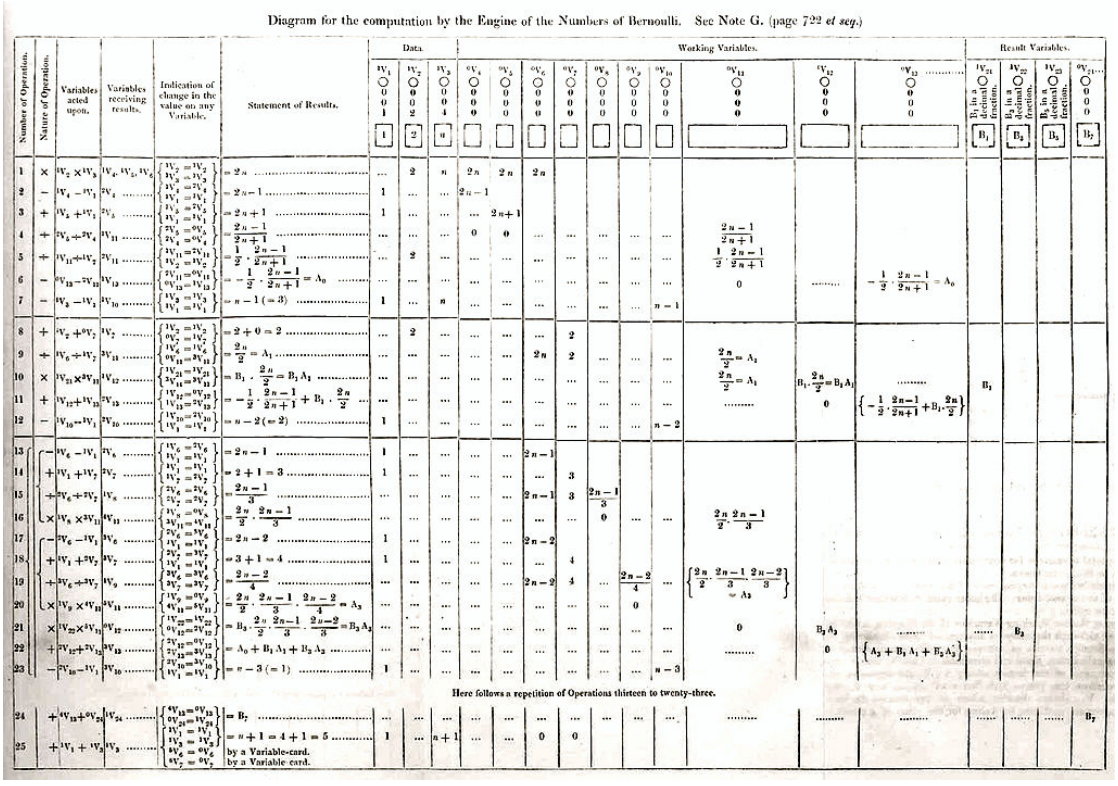


Figure 1: Bernoulli numbers program (Wikimedia, Public domain)

In a letter to Babbage dated 5 July 1843 Lovelace wrote,

> I am doggedly attacking and sifting to the very bottom, all the ways of deducing the Bernoulli Numbers.

— British Library: Add. MS 37192, folio 349.
— Stein, Dorothy (1985). "Ada: A Life and a Legacy", Cambridge: The MIT Press, p. 107.

In a letter to Babbage dated 10 July 1843 Lovelace wrote,

> I want to put in something about Bernoulli's Numbers, in one of my Notes, as an example of how an implicit function may be worked out by the engine, without having been worked out by human head & hands first. Give me the necessary data & formulae.

— British Library: Add. MS 37192, folios 362-363.
— Kim, Eugene Eric; Toole, Betty Alexandra (1999). "Ada and the first computer", Scientific American, 280 (5): 71–76.

- In her Note G she explained, what is meant by "data" for the Bernoulli numbers:

> Six numerical data are in this case necessary for making the requisite combinations. These data are 1, 2, n, B1, B3, B5.

— Menabrea, Luigi Federico; Lovelace, Ada (1843). "Sketch of the Analytical Engine invented by Charles Babbage... with notes by the translator. Translated by Ada Lovelace", Scientific Memoirs, 3, London: Richard and John E. Taylor, pp. 666–731.

- Beside the data, the Bernoulli numbers diagram contains also "formulae". These formulae are 2n-1, 2n+1, etc..

Claim. Lovelace got the whole content of the Bernoulli numbers diagram (Figure 1) from Babbage.

In a letter to Babbage dated 21 July 1843 Lovelace wrote,

> I am in much dismay at having got into so amazing a quagmire and botheration with these Numbers, that I cannot possibly get the thing done today... at this moment I am in a charming state of confusion.

— British Library: Add. MS 37192, folio 382.
— Stein, Dorothy (1985). "Ada: A Life and a Legacy", Cambridge: The MIT Press, p. 107.

> The Notes were completed by August 1843, and that they appeared as the last article of Volume 3 of Taylor's Scientific Memoirs in September 1843.

— Green, Christopher D. (2000). "Introduction to Ada Lovelace's Translation of, and Notes to, Luigi F. Menabrea's "Sketch of the analytical engine invented by Charles Babbage, Esq." (1842/1843)". Classics in the History of Psychology. Retrieved 2015-12-15.

> By the end of July 1843, Ada had pretty much finished writing her notes.

— Stephen Wolfram Blog, "Untangling the Tale of Ada Lovelace", December 10, 2015.

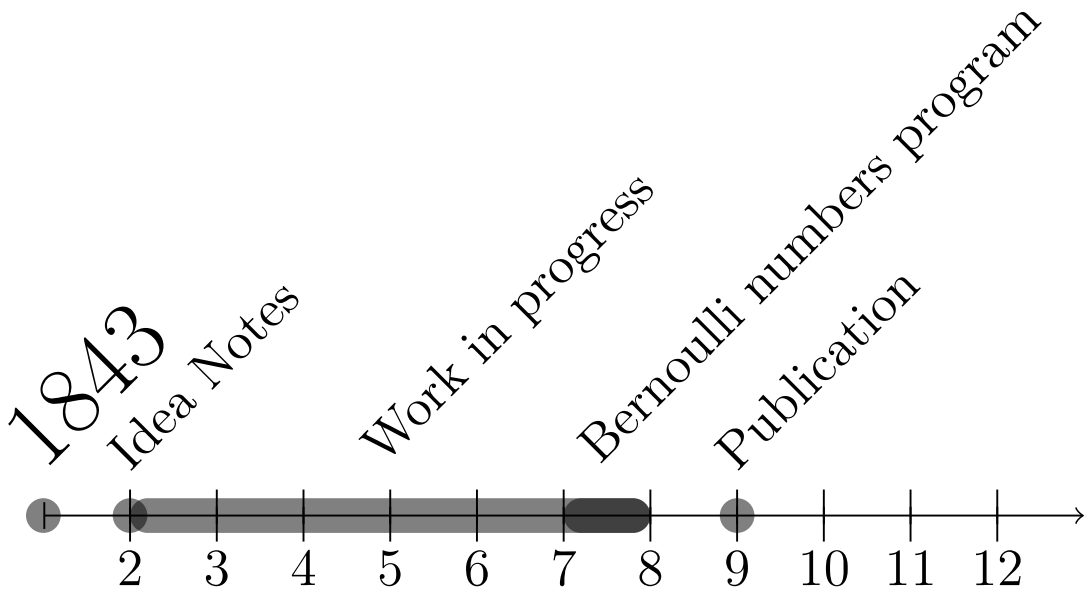
In a letter to Babbage dated 14 August 1843 Lovelace wrote,

> ... arrangement of the notes are shaped, they are very complete...

— British Library: Add. MS 37192, folio 422.
— Essinger, James (2004). "Jacquard's Web: How a hand-loom led to the birth of the information age", OUP Oxford, Appendix 2, ISBN: 019150114X.
— Toole, Betty Alexandra (1992), "Ada, the Enchantress of Numbers: A Selection from the Letters of Ada Lovelace, and her Description of the First Computer", Strawberry Press, p. 227, ISBN: 0912647094.

Claim. So she did the work on the Bernoulli numbers program (Figure 1) in a month. In this short period of time, she also must have written at least large parts of Note G (the part concerning the Bernoulli program) and did make this ready for publication.

Timeline Notes (1843)



Is the Bernoulli numbers program the "first computer program"?

Kim and Toole wrote,

> Many people, for instance, incorrectly claim that Ada was the first computer programmer. (Babbage, not Ada, wrote the first programs for his Analytical Engine, although most were never published.)

— Kim, Eugene Eric; Toole, Betty Alexandra (May 1999). "Ada and the first computer". Scientific American, 280 (5): 71–76.

What are the sources from peer-reviewed technical literature?

Allan G. Bromley wrote:

> Some two dozen programs for the Analytical Engine exist dated between 1837 and 1840.

— Bromley, Allan G. (July–September 1982). "Analytical Engine". Annals of the History of Computing (IEEE), 4 (3): 215.

Claim. The Bernoulli numbers program is not the first computer program.

Summary

Claim. The Bernoulli numbers program has been developed by Charles Babbage und is not the first computer program.